

## HIV CTL Epitopes

**Table 4 RT**

Location	WEAU	Sequence	Immunogen	Species(HLA)	References
RT(18-26)	RT(173-181)	GPKVKQWPL	HIV-1 infection	human(B8)	[Meier et al.(1995)]
	• HIV bearing mutations in epitope allowed transactive inhibition of specific CTL mediated lysis				
RT(71-79 LAI)	RT(59-67)	ITLWQRPLV	?	human(A*6802)	[Brander & Walker(1996)]
	• Clade A/B/D consensus, HLA A28 subtype, S. Rowland-Jones, pers. comm.				
RT(71-79 LAI)	RT(59-67)	ITLWQRPLV	?	human(A19)	[Brander & Walker(1996)]
	• Clade A/B/D consensus, HLA subtype A*7401, S. Rowland-Jones, pers. comm.				
RT(85-93 Clade D)	RT(86-94)	DTVLEEMNL	?	human(A28)	[Brander & Walker(1996)]
	• Clade D, HLA subtype A*6802, S. Rowland-Jones, pers. comm.				
RT(160-184 HXB2)	RT(160-184)	IETVPVKLKPGMDGP- KVQWPLTEE	HIV-1 infection	human(B8)	[Walker et al.(1989)]
	• One of five epitopes defined for RT specific CTL clones				
RT(185-193 LAI)	RT(173-181)	GPKVKQWPL	no CTL shown	human(B8)	[Sutton et al.(1993)]
	• Predicted epitope based on B8 binding motifs, from larger peptide IETVPVKLKPGMDGPVKQWPLTEE				
RT(185-193 LAI)	RT(173-181)	GPKVKQWPL	HIV-1 infection	human(B8)	[Klenerman et al.(1995)]
	• Naturally occurring antagonist GPRVKQWPL found in viral PBMC DNA and RNA				
RT(205-219 BRU)	RT(193-207)	CTEMEKEGKISKIGP	recRT injection	murine(H2 <sup>k</sup> )	[De Groot et al.(1991)]
	• Murine and human helper and CTL epitope				
RT(205-219)	RT(193-207)	CTEMEKEGKISKIGP	HIV-1 infection	human(broad)	[Hosmalin et al.(1990)]
	• Murine and human helper and CTL epitope				
RT(267-277)	RT(263-273)	VLDVGDAYFSV	none	human(A*0201)	[van der Burg et al.(1996)]
	• High dissociation rate, but immunogenic in primary CTL induction after repeated stimulations with peptide				
	• CTL generated by <i>in vitro</i> stimulation of PBMC driven from uninfected individual				
RT(267-277)	RT(263-273)	VLDVGDAYFSV	none	human(A2)	[van der Burg et al.(1995)]
	• Binds HLA-A*0201 – CTL generated by <i>in vitro</i> stimulation of PBMC				
	• CTL generated by <i>in vitro</i> stimulation of PBMC driven from uninfected individual				
RT(262-270 IIIB)	RT(262-270)	TVLDVGDAY	HIV-1 infection	human(B35)	[Wilkes et al.(1996)]
	• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study				
RT(273-282 IIIB)	RT(273-282)	VPLDEDFRKY	HIV-1 infection	human(B35)	[Shiga et al.(1996)]
	• Binds HLA-B*3501				
RT(296-304 IIIB)	RT(296-304)	GIRYQYNVL	HIV-1 infection	human(?)	[Wilkes et al.(1996)]
	• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study				
	• KIKYQYNVL, a naturally occurring variant, was found in mother				
RT(295-302 IIIB)	RT(283-290)	TAFTIPI	HIV-1 infection	human(B51)	[Sipsas et al.(1996)]

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Location	WEAU	Sequence	Immunogen	Species(HLA)	References
RT(308-320)	RT(308-320)	WKGS <sup>P</sup> AIFQSSMT	HIV-1 infection	human(B7)	[Brander & Walker(1995)]
	• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study				
RT(311-319 SF2)	RT(311-319)	SPAIFQSSM	HIV-1 infection	human(B35)	[Shiga et al.(1996)]
	• Binds HLA-B*3501				
RT(325-333 IIIB)	RT(313-321)	AIFQSSMTK	HIV-1 infection	human(A3)	[Wilkes et al.(1996)]
	• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study				
	• AIFQSSMTR and AFLSSMTK, naturally occurring variants, were found in infant, and are recognized				
	• TISQSSMTK, a naturally occurring variant, was found in infant and is not recognized				
RT(325-333 LAI)	RT(313-321)	AIFQSSMTK	HIV-1 infection	human(A11,A3)	[Threlkeld et al.(1996)]
RT(325-349 PV22)	RT(313-337)	AIFQSSMTKILEPFR-KQNPDIVIYQ	HIV-1 infection	human(A11)	[Jassoy et al.(1993)]
	• HIV-1 specific CTLs release $\gamma$ -IFN, and $\alpha$ - and $\beta$ -TNF				
RT(325-349)	RT(313-337)	AIFQSSMTKILEPFR-KQNPDIVIYQ	HIV-1 infection	human(A11)	[Price et al.(1995)]
	• Study of cytokines released by HIV-1 specific activated CTL				
RT(325-333)	RT(313-321)	AIFQSSMTK	HIV-1 infection	human(A3.1)	[Brander & Walker(1995)]
	• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study				
RT(325-333 LAI)	RT(313-321)	AIFQSSMTK	No CTL shown	human(A11)	[Zhang et al.(1993)]
	• Exploration of A11 binding motif, based on Nixon et al. 1991; this peptide is mislabeled as a Gag peptide in Zhang et al.				
RT(325-333 LAI)	RT(313-321)	AIFQSSMTK	HIV-1 infection	human(A11)	[McMichael & Walker(1994)]
	• Review of HIV CTL epitopes; defined as minimal peptide by titration curve				
RT(325-333 LAI)	RT(313-321)	AIFQSSMTK	?	human(A33)	[Ariyoshi, unpublished(1995)]
	• Defined as minimal peptide by titration curve, S. Rowland-Jones, per. comm.				
RT(342-366 LAI)	RT(330-354)	NPDIVIYQYMDDLYV-GSDLEIGQHR	HIV-1 infection	human(A11)	[Walker et al.(1989)]
	• One of five epitopes defined for RT specific CTL clones				
RT(342-350 LAI)	RT(330-338)	HPDIVIYQY	HIV-1 infection	human(B35)	[McMichael & Walker(1994)]
	• Review of HIV CTL epitopes; defined as minimal peptide by titration curve				
RT(329-337)	RT(330-338)	HPDIVIYQY	HIV infection	human(B35)	[Rowland-Jones et al.(1995)]
	• NPDIVIYQY preferred sequence for some CTL clones, HIV-2 NPDVILIQY is also recognized				
RT(328-336 IIIB)	RT(330-338)	NPDIVIYQY	HIV-1 infection	human(B35)	[Shiga et al.(1996)]
	• Binds HLA-B*3501				
RT(346-354 LAI)	RT(334-342)	VIYQYMDDL	HIV infection	human(A2)	[Harrer et al.(1996a)]
	• The substitution VIYQYVDDL abrogates CTL response and confers drug resistance; YMDD is a highly conserved motif				
RT(359-383 HXB2)	RT(347-371)	DLEIGQHRTKIEELR-QHLLRWGLTT	HIV-1 infection	human(Bw60)	[Walker et al.(1989)]
	• One of five epitopes defined for RT specific CTL clones				

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Location	WEAU	Sequence	Immunogen	Species(HLA)	References
RT(415-426 IIIB) • P. Johnson, pers. comm.	RT(415-426)	LVGKLNWASQIY		human(Bw62)	[Brander & Walker(1996)]
RT(438-446 IIIB) • Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study	RT(426-434)	YPGIKVRQL	HIV-1 infection	human(B42)	[Wilkes et al.(1996)]
RT(448-456 SF2) • Binds HLA-B*3501 and B*5101	RT(448-456)	IPLTEEAEL	HIV-1 infection	human(B35,B51)	[Shiga et al.(1996)]
RT(461-485 HXB2) • One of five epitopes defined for RT specific CTL clones	RT(449-473)	PLTEEAELELAENRE- ILKEPVHGVY	HIV-1 infection	human(A2)	[Walker et al.(1989)]
RT(476-484) • CTL clones recognize naturally processed peptide; peptide abundance corresponded to level of CTL killing	RT(464-472)	ILKEPVHGV	HIV-1 infection	human(A2)	[Tsomides et al.(1994)]
RT(468-476) • Immunogenic in humans, slow dissociation rate, associated with immunogenicity in transgenic HLA-A*0201/K <sup>b</sup> mice • CTL generated by <i>in vitro</i> stimulation of PBMC driven from uninfected individual	RT(464-472)	ILKEPVHGV	none	human(A*0201)	[van der Burg et al.(1996)]
RT(468-476) • Binds HLA-A*0201 – CTL generated by <i>in vitro</i> stimulation of PBMC • from an HIV negative donor	RT(464-472)	ILKEPVHGV	none	human(A*0201)	[van der Burg et al.(1995)]
RT(476-484) • Mutational study: 476 I to Y increases complex stability with HLA-A*0201	RT(464-472)	ILKEPVHGV	HIV-1 infection	human(A*0201)	[Pogue et al.(1995)]
RT(476-485 LAI) • Review of HIV CTL epitopes; defined as minimal peptide by titration curve • Also: P. Johnson 1991 and pers. comm. P. Johnson	RT(464-473)	ILKEPVHGVY	HIV-1 infection	human(Bw62)	[McMichael & Walker(1994)]
RT(476-484 LAI) • Precise identification of the nonamer that binds to A2	RT(464-472)	ILKEPVHGV	HIV-1 infection	human(A2)	[Tsomides et al.(1991)]
RT(476-484 LAI) • Promotes assembly of HLA-A2 molecules in T2 cell lysates	RT(464-472)	ILKEPVHGV	no CTL shown	human(A2)	[Connan et al.(1994)]
RT(510-518) • Studied in the context of HLA A2 peptide binding	RT(464-472)	ILKEPVHGV	no CTL shown	human(A2)	[Parker et al.(1992)]
RT(495-515 LAI) • One of five epitopes defined for RT specific CTL clones	RT(483-507)	EIQKQQGQQWTYQIY- QEPFKNLKTG	HIV-1 infection	human(A11)	[Walker et al.(1989)]
RT(507-519 LAI) • This epitope was listed in a review	RT(495-507)	QIYQEPFKNLKTG	HIV-1 infection	human(A11)	[Johnson & Walker(1994)]
RT(507-516) • Study of cytokines released by HIV-1 specific activated CTL	RT(495-505)	QIYQEPFKNLK	HIV-1 infection	human(?)	[Price et al.(1995)]
RT(518-526 U455) • S. Rowland-Jones, pers. comm. Reacts with clade A consensus (U455), HLA-subtype A*6802	RT(519-527)	DVKQLTEVV	?	human(A28)	[Brander & Walker(1996)]

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Location	WEAU	Sequence	Immunogen	Species(HLA)	References
RT(547-556 IIIB)	RT(547-556)	PIQKETWETW	HIV-1 infection	human(B53/Cw2)	[Wilkes et al.(1996)]
		• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study			
		• PIQKEAWETW, a naturally occurring variant, was found in non-transmitting mother and is recognized			
RT(587-597 SF2)	RT(587-596)	EPIVGAETFY	HIV-1 infection	human(B35)	[Shiga et al.(1996)]
		• Binds HLA-B*3501, and not presented by B51, in contrast to EPIVGAETF			
RT(587-596 SF2)	RT(587-595)	EPIVGAETF	HIV-1 infection	human(B35,B51)	[Shiga et al.(1996)]
		• Binds HLA-B*3501, and presented by B51 – CTL could not kill RT-vaccina virus infected cells that expressed B51; but could kill B35 expressing RT-vaccina virus infected cells			
RT(591-600 IIIB)	RT(591-600)	GAETFYVDGA	HIV-1 infection	human(B45)	[Wilkes et al.(1996)]
		• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study			
		• GVETFYVDGA, a naturally occurring variant, was recognized			
RT(592-602 LAI)	RT(592-602)	AETFYVDGAAAN	?	human(A28)	[Brander & Walker(1996)]
		• P. Johnson pers. comm.			
RT(593-603 IIIB)	RT(593-603)	ETFYVDGAANR	HIV-1 infection	human(A26)	[Wilkes et al.(1996)]
		• Epitope defined in the context of the Pediatric AIDS Found. ARIEL project mother-infant HIV transmission study			
		• ETYYVNGAANR, a naturally occurring variant, was found in non-transmitting mother and is recognized			
RT(648-672 PV22)	RT(636-660)	AIYLALQDSGLEVNIVTDSQYALGI	HIV-1 infection	human(B14)	[Kalams et al.(1994)]
		• A CTL response used to study gene usage in HLA B14 response			
RT(648-672)	RT(636-660)	AIYLALQDSGLEVNIVTDSQYALGI	HIV-1 infection	human(?)	[Price et al.(1995)]
		• Study of cytokines released by HIV-1 specific activated CTL			
RT(648-672)	RT(640-660)	ALQDSGLEVVTD SQYALGI	HIV-1 infection	human(B14)	[Brander & Walker(1995)]
		• Unpublished, S. Kalams			
RT(640-648 HXB2R)	RT(640-648)	ALQDSGLEV	no CTL shown	human(A2)	[Brander et al.(1995)]
		• Epitope studied in the context of inclusion in a synthetic vaccine			
RT(663-672 IIIB)	RT(651-660)	VTDSQYALGI	HIV-1 infection	human(Cw8)	[Brander & Walker(1996)]
		• Unpublished, P. Johnson; defined as minimal peptide by titration curve McMichael94			
		• Published here in 1995 as B14, but B14 transfected cells did not present the peptide			
RT(956-964 HXB2R)	RT(956-964)	LLWKGE GAV	no CTL shown	human(A2)	[Parker et al.(1992), Parker et al.(1994)]
		• Studied in the context of HLA A2 peptide binding			
RT(956-964 HXB2R)	RT(956-964)	LLWKGE GAV	no CTL shown	human(A2)	[Brander et al.(1995)]
		• No CTL activity found in HIV infected subjects, epitope studied in the context of inclusion in a synthetic vaccine			
RT(576-584)	RT(956-964)	LLWKGE GAV	none	human(A*0201)	[van der Burg et al.(1996)]
		• Slow dissociation rate, associated with immunogenicity in transgenic HLA-A*0201/K <sup>b</sup> mice			
		• CTL generated by <i>in vitro</i> stimulation of PBMC driven from uninfected individual			